

# JAY PATEL

Ph.D. student | Social Networks Analysis | Data Science (Python) | ML & AI

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## Research Interest (2021 - Present) - [iDRAMA Lab](#)

- I work on detecting **misinformation** from Social Media Platforms - Reddit, Twitter, & 4chan.
- Understanding **multimedia(memes & videos) content** & developing **Graph-network algorithms** to unveil hidden coordinated groups from social media platforms.
- [USAToday\(MediaCoverage\)](#) - Computer vision model to detect ``Kekistani flag`` from 1M images. [read here](#)

## Professional Summary

- 4+ years of academic research experience(GRA) - **AI projects, Deep Learning, and Evolutionary Computing.**
- 3+ years of industrial work experience - **iOS Software Engineer, Full Stack Engineer, UI/UX Designer.**
- 20+ talks on *Google Cloud Platform(GCP)* as a **Founder of [GDG Cloud Auburn](#)** - a chapter of Google Developers Group, Lead Organizer for 2 years.
- Tech conference organizer of [DevFestAuburn19](#) for 100+ attendees, 10+ speakers at [Auburn University.](#)

## Education

<b>Ph.D. student, Computer Science</b> , StateUni of NY@Binghamton, NY	<b>GPA - 3.73</b>	Aug 2021 - Present
- Advisor: <a href="#">Dr. Jeremy Blackburn</a>		
<b>MS-Research, Computer Science &amp; SE</b> , Auburn University, AL	<b>GPA - 3.57</b>	Aug 2021
<b>MS, Computer Science</b> , Northwestern Polytechnic University, CA	<b>GPA - 3.76</b>	Dec 2016
<b>BE, Computer Engineering</b> , Gujarat Technological University – India	<b>GPA - 3.00</b>	May 2014

## Industry Experience

<b>Software Engineer Intern, iOS – IMVU, Redwood City, CA</b>	July 2017 - Dec 2017
• Achievement: Being called as a “ <b>TestGURU</b> ” for writing solid test cases to newly migrated code in swift.	
<b>Software Engineer Intern – Attala Systems Corp., San Jose, CA</b>	March 2017 - July 2017
<b>iOS Software Engineer Intern – RiteTag</b>	May 2016 - Oct 2016
<b>iOS Software Engineer Intern – Filmakr Labs LLC</b>	July 2016 - Sep 2016
<b>iOS Application Developer – Cimcon Software PVT LTD, India</b>	April 2014 - Aug 2015

## Academic Research Experience (6 projects → 2 publication in-progress)

<b>Understanding memes through multimodal fusion techniques</b>	Aug 2022 - Present
• Fine tune state-of-art vision and language model with fusion technique to understand multimodal memes.	
<b>Detect images that spreads propaganda (aka misinformation)</b>	Aug 2022 - Present
• Developing a pipeline to detect propagandic objects (e.g., nazi flag) on fly from social media posts.	
<b>Detect hidden coordinated groups from Reddit platform</b>	March 2021 - Present
• Developing clustering techniques to detect hidden communities from Reddit & Twitter.	
<b>Evolve AI Agents for Satellite Mega-constellations game</b> , AuburnUni.	Oct 2020 - Aug 2021
• Evolving Artificial Intelligent(AI) agents to play against human players in a multiplayer game to model economic competition of mega-constellations using Genetic Programming & Evolutionary Algorithms.	
<b>Competitive Coevolution for Satellite Mega-constellations Security</b> , AuburnUni.	Feb 2020 - Oct 2020
• <b>PUBLICATION:</b> Jay Patel, Dhathri H. Somavarapu, Deacon Seals, Daniel R. Tauritz, and Davide Guzzetti. <a href="#">Ad-versarial Threats to LArge Satellite Networks (ATLAS-N): A Coevolutionary Approach Based on Flipt.</a> In Proceedings of the 22nd Annual Conference Companion on Genetic and Evolutionary Computation (GECCO '20), pages 1503–1511, Cancún, Mexico, July 8-12, 2020.	
<b>Behavior, Inference, Cognition Model for Self-Driving car(Level-3)</b> , AuburnUni.	Jan 2018 - Dec 2018

## Graduate Teaching Assistant

JAN 2018 - Present

- CS515 - Social Media Data Science Pipeline (Fall '22)
- COMP3500 - Introduction to Operating Systems (Spring '18)
- COMP3220 - Programming Languages (Spring '18, Fall '18, Fall '19, Spring '20)
- COMP7270 - Advanced Algorithms (Spring '19)

## Key Skills

**Languages: Proficient in** - Python, Swift, Objective-C, Java | **Intermediate** - Ruby, C/C++, JS, Dart, Typescript, C#, Php, Scheme, Prolog, Ada, HTML5, CSS/SCSS, R programming, SAS Software

**Python:** Numpy, Pandas, Matplotlib, NetworkX, Django, Flask, RESTful Technology, Multiprocessing

**AI/ML Frameworks:** Tensorflow, Pytorch, Keras, iNNvestigate, LightGBM, Scikit-Learn

**iOS:** MVC/MVVM, Push Services, SQLite, Core data, iCloud, AVFoundation, MLKit, Autolayout, CocoaPods

**Java:** Jsp, Servlet, RMI, JDBC, Collections, Spring, Design Patterns, Multithreading, Networking, JAX-RS, REST

**Cloud & Databases:** AWS, Google Cloud Platform, Heroku, Mysql, SQLite, Realm DB, MongoDB, Postgresql

**APIs:** Google Maps/Vision/Analytics API, Facebook graph API, Twitter API, Square & Stripe payment API

## Selected Projects

### Detect images that spreads propaganda in the wild – [Deep Learning, Tensorflow, Python]

- In this work, I trained a neural-network model that detects “kekistani flag” from social media platforms. We scaled the model to run in *less than 3 hours on 1 million images* collected from 4chan with *91% accuracy*.
- One of the major challenges is unlabeled dataset to train the model and achieve higher Precision measure.

### Detect hidden coordinated groups from Reddit platform – [NetworkX, Graph-algo, Clustering Python]

- This work uses graph algorithms to detect hidden coordinated groups from graph clusters. I created a custom similarity metric that leverages minimum information from social media users.
- The methodology works on a huge graph network that includes about *1 million edges connected between ~20k nodes*.

### Data collection from social media platforms – [Beautifulsoup, Faktory, Docker, Python, PostgreSQL]

- I have developed a continuous efficient data collection system that collects the data from websites like 4chan and Reddit, stores into PostgreSQL and media to S3. This system has collected *5 million data records in the last 4 months*.

### Evolve AI-agents to play economic game – [Genetic Programming, Evolutionary Algorithms, Python]

- In this work, I developed an AI-agent that evolves novel business strategies to win an economic competition in a multi-player setting. *The proud unpublished research project with 2500+ lines of code and 1000+ hours of simulation*.

### Behavior, Inference, Cognition Model for Self-Driving car(Level-3) – [ML ensemble modeling, Python]

- Predict the next action of the driver by ensembling three machine-learning models VGG16, LSTM and Gradient-boosting decision tree. We achieved 80+% accuracy in driver’s behavior prediction. [More..](#)

## Leadership, Volunteer, and Organizational Experience

**Founder & Lead Organizer @GDG Cloud Auburn**

March 2019 - March 2021

**Media Developer @Indian Students Association**

Jan 2019 - Aug 2020

**Volunteer tutor to Elementary schools @Code.org Volunteer**

Jan 2017 - Aug 2021

## Related coursework

Social Media Data Science Pipeline | Theory of Nonlinear optimization | Matrix theory & applications | Experimental Statistics-I & Experimental Statistics-II | Advanced Operating Systems | Advanced Computer Architecture | Artificial Intelligence | Big Data – Hadoop, MapReduce | Algorithms & Data structure | Mobile Application Development | Cloud computing